Abstract

A remote emissions sensing system is provided with NO_x detection capability. First, a reading of the ambient NO_x concentration is taken just prior to each vehicle passing through the system. This measurement accounts for any ambient NO_x concentration that may be lingering from the exhaust of a previous vehicle. Next, the system takes a blocked reading when the vehicle is located in the path of the beam. This reading accounts for any ambient or system noise that may exist. Finally, the system takes a reading of the exhaust plume as the beam passes through the plume. A processor determines the portion of the reading due to the exhaust plume by subtracting the ambient and blocked readings from the exhaust plume reading. As a result, a more accurate exhaust concentration reading is provided. Additionally, the system may process exhaust plume readings only in a predetermined wavelength band associated with the known absorption spectrum of NO_x so that data points for which there is no significant absorption of NO_x may be eliminated. Thus, any noise or other interference in the non-absorptive wavelengths are minimized. Also, changes in the intensity of the radiation are compensated by subtracting a baseline intensity from each signal.